

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Original) An albumin fusion protein comprising a member selected from the group consisting of:

(a) a Therapeutic protein:X and albumin comprising the amino acid sequence of SEQ ID NO:1038;

(b) a Therapeutic protein:X and a fragment or a variant of the amino acid sequence of SEQ ID NO:1038, wherein said fragment or variant has albumin activity;

(c) a Therapeutic protein:X and a fragment or a variant of the amino acid sequence of SEQ ID NO:1038, wherein said fragment or variant has albumin activity, and further wherein said albumin activity is the ability to prolong the shelf life of the Therapeutic protein:X compared to the shelf-life of the Therapeutic protein:X in an unfused state;

(d) a Therapeutic protein:X and a fragment or a variant of the amino acid sequence of SEQ ID NO:1038, wherein said fragment or variant has albumin activity, and further wherein the fragment or variant comprises the amino acid sequence of amino acids 1-387 of SEQ ID NO:1038;

(e) a fragment or variant of a Therapeutic protein:X and albumin comprising the amino acid sequence of SEQ ID NO:1038, wherein said fragment or variant has a biological activity of the Therapeutic protein:X;

(f) a Therapeutic protein:X, or fragment or variant thereof, and albumin, or fragment or variant thereof, of (a) to (e), wherein the Therapeutic protein:X, or fragment

or variant thereof, is fused to the N-terminus of albumin, or the N-terminus of the fragment or variant of albumin;

(g) a Therapeutic protein:X, or fragment or variant thereof, and albumin, or fragment or variant thereof, of (a) to (e), wherein the Therapeutic protein:X, or fragment or variant thereof, is fused to the C-terminus of albumin, or the C-terminus of the fragment or variant of albumin;

(h) a Therapeutic protein:X, or fragment or variant thereof, and albumin, or fragment or variant thereof, of (a) to (e), wherein the Therapeutic protein:X, or fragment or variant thereof, is fused to the N-terminus and C-terminus of albumin, or the N-terminus and C-terminus of the fragment or variant of albumin;

(i) a Therapeutic protein:X, or fragment or variant thereof, and albumin, or fragment or variant thereof, of (a) to (e), which comprises a first Therapeutic protein:X, or fragment or variant thereof, and a second Therapeutic protein:X, or fragment or variant thereof, wherein said first Therapeutic protein:X, or fragment or variant thereof, is different from said second Therapeutic protein:X, or fragment or variant thereof;

(j) a Therapeutic protein:X, or fragment or variant thereof, and albumin, or fragment or variant thereof, of (a) to (i), wherein the Therapeutic protein:X, or fragment or variant thereof, is separated from the albumin or the fragment or variant of albumin by a linker;

(k) a Therapeutic protein:X, or fragment or variant thereof, and albumin, or fragment or variant thereof, of (a) to (j), wherein the albumin fusion protein has the following formula:

R1-L-R2; R2-L-R1; or R1-L-R2-L-R1,

and further wherein R1 is Therapeutic protein:X, or fragment or variant thereof, L is a peptide linker, and R2 is albumin comprising the amino acid sequence of SEQ ID NO:1038 or a fragment or variant of albumin;

(l) a Therapeutic protein:X, or fragment or variant thereof, inserted into an albumin, or fragment or variant thereof, comprising the amino acid sequence of SEQ ID NO:1038 or fragment or variant thereof;

(m) a Therapeutic protein:X, or fragment or variant thereof, inserted into an albumin, or fragment or variant thereof, comprising an amino acid sequence selected from the group consisting of:

- (i) amino acids 54 to 61 of SEQ ID NO:1038;
- (ii) amino acids 76 to 89 of SEQ ID NO:1038;
- (iii) amino acids 92 to 100 of SEQ ID NO:1038;
- (iv) amino acids 170 to 176 of SEQ ID NO:1038;
- (v) amino acids 247 to 252 of SEQ ID NO:1038;
- (vi) amino acids 266 to 277 of SEQ ID NO:1038;
- (vii) amino acids 280 to 288 of SEQ ID NO:1038;
- (viii) amino acids 362 to 368 of SEQ ID NO:1038;
- (ix) amino acids 439 to 447 of SEQ ID NO:1038;
- (x) amino acids 462 to 475 of SEQ ID NO:1038;
- (xi) amino acids 478 to 486 of SEQ ID NO:1038; and
- (xii) amino acids 560 to 566 of SEQ ID NO:1038;

(n) two or more tandemly oriented Therapeutic protein:X polypeptides, or fragments or variants thereof, fused to the N-terminus of an albumin comprising the amino acid sequence of SEQ ID NO:1038 or fragment or variant thereof; and

(o) two or more tandemly oriented Therapeutic protein:X polypeptides, or fragments or variants thereof, fused to the C-terminus of an albumin comprising the amino acid sequence of SEQ ID NO:1038 or fragment or variant thereof.

2-13. (Cancelled)

14. (Original) A method of treating a disease or disorder in a patient, comprising the step of administering the albumin fusion protein of claim 1.

15. (Original) A method of treating a metabolic/endocrine disorder in a patient, comprising administering the albumin fusion protein of claim 1.

16. (Original) A method of treating diabetes or a condition associated with diabetes in a patient, comprising administering the albumin fusion protein of claim 1.

17-25. (Cancelled)

26. (Currently amended) A method of treating obesity or of losing weight in a patient, comprising administering ~~[[the]]~~ an albumin fusion protein of claim 4 comprising two or more tandemly oriented GLP-1 polypeptides, wherein (i) said GLP-1 polypeptides are selected from wild-type GLP-1, GLP-1 fragments, and GLP-1 variants, fused to albumin comprising the amino acid sequence of SEQ ID NO:1038, an albumin fragment, or albumin variant thereof, (ii) said albumin fragment or albumin variant increases the serum plasma half-life of the GLP-1 polypeptides, and (iii) said fusion protein has GLP-1 activity.

27-28. (Cancelled)

29. (Original) A method of extending the shelf life of Therapeutic protein:X, or fragment or variant thereof, comprising the step of fusing the Therapeutic protein:X, or fragment or variant thereof, to albumin, or fragment or variant thereof, sufficient to extend the shelf-life of the Therapeutic protein:X, or fragment or variant thereof, compared to the shelf-life of the Therapeutic protein:X, or fragment or variant thereof, in an unfused state.

30. (Original) A nucleic acid molecule comprising a polynucleotide sequence encoding the albumin fusion protein of claim 1.

31-32. (Cancelled)

33. (New) The method of claim 26, wherein said tandemly oriented GLP-1 polypeptides are selected from wild type GLP-1 sequences.

34. (New) The method of claim 26, wherein said tandemly oriented GLP-1 polypeptides are selected from GLP-1 fragment sequences.

35. (New) The method of claim 26, wherein said tandemly oriented GLP-1 polypeptides are selected from GLP-1 variant sequences.

36. (New) The method of claim 26, wherein said tandemly oriented GLP-1 polypeptides are selected from at least one wild type GLP-1 sequence fused to at least one GLP-1 fragment sequence.

37. (New) The method of claim 26, wherein said tandemly oriented GLP-1 polypeptides are selected from at least one wild type GLP-1 sequence fused to at least one GLP-1 variant sequence.

38. (New) The method of claim 26, wherein said tandemly oriented GLP-1 polypeptides are selected from at least one GLP-1 fragment sequence fused to at least one GLP-1 variant sequence.

39. (New) The method of claim 26, wherein said GLP-1 fragments or GLP-1 variants are selected from:

- a. GLP-1(9-36);
- b. GLP-1(7-36);
- c. GLP-1(7-36(A8G)); and
- d. GLP-1(7-36(A8S)).

40. (New) The method of claim 39, wherein said GLP-1 fragments or GLP-1 variants are selected from two tandemly oriented GLP-1(7-36(A8G)).

41. (New) The method of claim 40, wherein said two tandemly oriented GLP-1(7-36(A8G)) are fused at the N-terminus to albumin.

42. (New) The method of claim 40, wherein said two tandemly oriented GLP-1(7-36(A8G)) are fused at the C-terminus to albumin.

43. (New) The method of claim 26, wherein said tandemly oriented GLP -1 polypeptides are fused at the N-terminus to albumin.

44. (New) The method of claim 26, wherein said tandemly oriented GLP -1 polypeptides are fused at the C-terminus to albumin.

45. (New) The method of claim 26, wherein said albumin fusion protein is produced from a host cell comprising a construct which expresses said albumin fusion protein, and wherein said construct is selected from:

- a. 2900;

- b. 2964;
- c. 2803;
- d. 2804;
- e. 2945;
- f. 2982;
- g. 3070;
- h. 3027;
- i. 3028;
- j. 3045;
- k. 3046;
- l. 3069;
- m. 3071;
- n. 3072;
- o. 3085;
- p. 3086;
- q. 3087;
- r. 3309; and
- s. 2904.

46. (New) The method of claim 26, wherein said albumin fusion protein is non-glycosylated.

47. (New) The method of claim 26, wherein said albumin fusion protein is expressed in yeast.

48. (New) The method of claim 47, wherein said yeast is a *S. cerevisiae*.

49. (New) The method of claim 47, wherein said yeast is glycosylation deficient.
50. (New) The method of claim 47, wherein said yeast is glycosylation and protease deficient.
51. (New) The method of claim 26, wherein said albumin fusion protein is expressed by a mammalian cell.
52. (New) The method of claim 51, wherein said mammalian cell is a CHO cell.
53. (New) The method of claim 26, wherein the albumin fusion protein further comprises a secretion leader sequence.
54. (New) The method of claim 26, wherein the albumin fusion protein is in a composition comprising a pharmaceutically acceptable carrier.
55. (New) A method of treating obesity or of losing weight in a patient, comprising administering an albumin fusion protein comprising two or more tandemly oriented GLP-1 polypeptides fused to albumin comprising the amino acid sequence of SEQ ID NO:1038, wherein said GLP-1 polypeptides comprise at least one amino acid sequence selected from:
- (a) amino acids 1 to 30 of SEQ ID NO:698;
 - (b) amino acids 100 to 127 of SEQ ID NO:429; and
 - (c) amino acids 98 to 127 of SEQ ID NO:430;
- and wherein said fusion protein has GLP-1 activity.
56. (New) The method of claim 55, wherein said GLP-1 polypeptides comprise at least one amino acid sequence of (a).

57. (New) The method of claim 56, wherein said GLP-1 polypeptides comprise at least two amino acid sequences of (a).

58. (New) The method of claim 55, wherein said GLP-1 polypeptides comprise at least one amino acid sequence of (b).

59. (New) The method of claim 58, wherein said GLP-1 polypeptides comprise at least two amino acid sequences of (b).

60. (New) The method of claim 55, wherein said GLP-1 polypeptides comprise at least one amino acid sequence of (c).

61. (New) The method of claim 60, wherein said GLP-1 polypeptides comprise at least two amino acid sequences of (c).

62. (New) The method of claim 55, wherein said GLP-1 polypeptides comprise at least one amino acid sequence of (a) and at least one amino sequence of (b).

63. (New) The method of claim 55, wherein said GLP-1 polypeptides comprise at least one amino acid sequence of (b) and at least one amino acid sequence of (c).

64. (New) The method of claim 55, wherein said GLP-1 polypeptides comprise at least one amino acid sequence of (a) and at least one amino acid sequence of (c).

65. (New) The method of claim 55, wherein said GLP-1 polypeptides are fused at the N-terminus to albumin.

66. (New) The method of claim 55, wherein said GLP-1 polypeptides are fused at the C-terminus to albumin.

67. (New) The method of claim 55, wherein the albumin fusion protein further comprises a secretion leader sequence.

68. (New) The method of claim 55, wherein the albumin fusion protein is in a composition comprising a pharmaceutically acceptable carrier.

69. (New) A method of treating obesity or of losing weight in a patient, comprising administering an albumin fusion protein comprising two or more tandemly oriented GLP-1 polypeptides fused to albumin, wherein said albumin fusion protein comprises an amino acid sequence selected from:

- (a) amino acids 25 to 669 of SEQ ID NO:419;
- (b) amino acids 25 to 669 of SEQ ID NO:420;
- (c) amino acids 25 to 669 of SEQ ID NO:421;
- (d) amino acids 25 to 667 of SEQ ID NO:422;
- (e) amino acids 25 to 669 of SEQ ID NO:423;
- (f) amino acids 25 to 669 of SEQ ID NO:424;
- (g) amino acids 25 to 667 of SEQ ID NO:425;
- (h) amino acids 30 to 674 of SEQ ID NO:447;
- (i) amino acids 20 to 664 of SEQ ID NO:598;
- (j) amino acids 20 to 664 of SEQ ID NO:599;
- (k) amino acids 19 to 663 of SEQ ID NO:600;
- (l) amino acids 19 to 663 of SEQ ID NO:601;
- (m) amino acids 24 to 668 of SEQ ID NO:609;
- (n) amino acids 86 to 730 of SEQ ID NO:610;
- (o) amino acids 18 to 662 of SEQ ID NO:611;

- (p) amino acids 86 to 730 of SEQ ID NO:612;
- (q) amino acids 24 to 668 of SEQ ID NO:613;
- (r) amino acids 18 to 662 of SEQ ID NO:614; and
- (s) amino acids 30 to 673 of SEQ ID NO:834;

and wherein said fusion protein has GLP-1 activity.

70. (New) The method of claim 69, wherein said albumin fusion protein comprises the amino acid sequence of (a).

71. (New) The method of claim 69, wherein said albumin fusion protein comprises the amino acid sequence of (d).

72. (New) The method of claim 69, wherein said albumin fusion protein comprises the amino acid sequence of (e).

73. (New) The method of claim 69, wherein said albumin fusion protein comprises the amino acid sequence of (h).

74. (New) The method of claim 69, wherein said albumin fusion protein further comprises a secretion leader sequence.

75. (New) The method of claim 69, wherein the albumin fusion protein is in a composition comprising a pharmaceutically acceptable carrier.

76. (New) A method of treating obesity or of losing weight in a patient, comprising administering an albumin fusion protein comprising two or more tandemly oriented GLP-1 polypeptides fused to albumin, wherein said fusion protein is produced from a host cell comprising the amino acid sequence of the 3070 construct contained in ATCC Deposit No. PTA-4671.

77. (New) The method of claim 76, wherein the albumin fusion protein is in a composition comprising a pharmaceutically acceptable carrier.